

Mahatma Education Society's  
**Pillai College of Arts, Commerce & Science (Autonomous)**

Affiliated to University of Mumbai

'NAAC Accredited 'A' grade (3 cycles)  
'Best College Award' by University of Mumbai  
ISO 9001:2015 Certified



## **SYLLABUS**

**Program: B.Sc. Economics**

**T.Y. B.Sc. Economics**

PCACS/BSE/SYL/2024-25/TY

**As per National Education Policy  
Choice Based Credit & Grading System (60:40)**

**Academic Year 2024-25**

*Pillai*

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S.N.	Name	Designation	Signature
1	Dr. Rinkoo Shantnu	HOD / Chairperson	
2	Dr. Aarti Sukheja	Member	
3	Ms. Praniti Rajapure	Member	
4	Dr. B. S. Patil	Vice Chancellor Nominee	
5	Mr. Sunil Ghadge	Subject Expert	
6	Ms. Saleha	Subject Expert	
7	CA Mr. Abhilash Tewari	Industry Representative	
8	Ms. Priti Mishra	Alumni Representative	

Dr. Rinkoo Shantnu  
Co-ordinator B.Sc. Economics

## **1. Introduction to the Program**

B.Sc. Economics programme of Pillai College of Arts, Commerce and Science (Autonomous) will equip you with a nuanced understanding of economic models and the ability to devise policy interventions to economic problems. Employers look for candidates who can produce reports that make use of advanced quantitative skills in analysis and modelling. The analytical reasoning and quantitative techniques provided by the said course will give the best employment prospects to the students.

This degree will open up myriad career options. Students will not only enjoy a substantial edge when applying for prestigious postgraduate programmes in Economics around the world, but will also become a highly competitive applicant for working in areas such as policy-making, data science, consulting, finance and economic research.

## 2. Programme Outcomes (POs) for B.Sc. Programme

Sr. No.	PO Brief
PO1	Develop a strong foundation in the core principles and theories of their chosen field of study to pursue a profession of choice by understanding fundamental concepts, methodologies, and key terminologies.
PO2	Trigger the research aptitude by developing basic research skills, including the ability to conduct literature reviews, design experiments, collect and analyze data, and draw meaningful conclusions.
PO3	Communicate scientific concepts, experimental results and analytical arguments clearly and concisely, both verbally and in writing and also ability to present their work through written, oral, and visual presentations, including an original research proposal in a clear and understandable manner to both technical and non-technical audiences.
PO4	Understand and adhere to ethical standards by recognizing the importance of integrity, honesty and ethical responsibility in scientific research and professional practice.
PO5	Ability to work cohesively to achieve common goals, solve problems and contribute to the success of a project or task paving way to individual and collective growth.
PO6	Engage themselves in lifelong learning to keep up with the pace of changing technology.
PO7	Acquisition of specialized technical skills and expertise relevant to the specific field of study i.e advanced laboratory techniques, computational skills, or other specialized methodologies.
PO8	Equipped with the ability to analyze information critically, think logically, and solve complex problems by applying scientific methods, mathematical reasoning, and logical approaches to real-world situations.

### 3. Programme Specific Outcomes (PSOs) for B.Sc Economics Programme

<b>PSO-1</b>	Apply quantitative skills and its application in economic analysis and modelling.
<b>PSO-2</b>	Exhibit in-depth practical skills for working in areas such as policy-making, data science, consulting, finance and economic research.
<b>PSO-3</b>	Develop understanding of economic models and the ability to devise policy interventions to economic problems.
<b>PSO-4</b>	Develop a research mindset by aiding deep insights into the dynamics of global and national economies.

## Course Structure

<b>Semester V</b>						
<b>Course Code</b>	<b>Course Type</b>	<b>Course Title</b>	<b>Theory/ Practical</b>	<b>Marks</b>	<b>Credits</b>	<b>Lectures per week</b>
PUSEC501	Core Course	Development Economics	Theory	100	4	4
PUSEC502	Core Course	Agricultural Economics	Theory	100	4	4
PUSEC503	Discipline Specific Course	Financial Economics	Theory	100	4	4
PUSEC504	Discipline Specific Course	Game Theory	Theory	100	2	2
PUSEC505	Skill Enhancement Course	Data Visualization & Decision Making	Theory	100	2	4
PUSEC506P	Skill Enhancement Course	Data Visualization & Decision Making Practical using Tableau/ Python	Practical	50	2	2
PUSEC507	Ability Enhancement Course	Internship	Practical	100	2	60 hours
PUSEC505E	Elective	Financial Institutions and Markets	Theory	100	4	4
				<b>650</b>	<b>20</b>	<b>20</b>

### Semester VI

Course Code	Course Type	Course Title	Theory/ Practical	Marks	Credits	Lectures per week
PUSEC601	Core Course	International Economics	Theory	100	4	4
PUSEC602	Core Course	Industrial Economics	Theory	100	4	4
PUSEC603	Discipline Specific Course	Urban Economics	Theory	100	4	4
PUSEC604	Ability Enhancement Course	Emotional Intelligence	Theory	100	2	3
PUSEC605	Skill Enhancement Course	Data Analysis	Theory	100	2	3
PUSEC606P	Skill Enhancement Course	Data Analysis Practical using Python	Practical	50	2	2
PUSEC607	Ability Enhancement Course	Project Work	Practical	100	2	2
PUSEC605E	Elective	Accountancy and Financial Statement Analysis	Theory	100	4	4
				<b>650</b>	<b>20</b>	<b>22</b>

## Evaluation Pattern

Marking Code	Marking Scheme
A	60 Marks Final Exam, 20 Marks Internal Exam, 20 Marks Field Project.
B	60 Marks Final Exam, 40 Marks Internal Exam.
C	100 marks distributed within report /case study/ project/ presentation etc.
D	50 Marks Practical Examination.

### Semester V3

Course Code	Course Type	Course Title	Evaluation Pattern
PUSEC501	Core Course	Development Economics	A
PUSEC502	Core Course	Agricultural Economics	A
PUSEC503	Discipline Specific Course	Financial Economics	A
PUSEC504	Discipline Specific Course	Game Theory	B
PUSEC505	Skill Enhancement Course	Data Visualization & Decision Making	A
PUSEC505P	Skill Enhancement Course	Data Visualization & Decision Making Practical using Tableau/ Python	D
PUSEC506	Ability Enhancement Course	Internship	C
PUSEC505E	Elective	Financial Institutions and Markets	A



**Semester IV**

<b>Course Code</b>	<b>Course Type</b>	<b>Course Title</b>	<b>Evaluation Pattern</b>
PUSEC601	Core Course	International Economics	A
PUSEC602	Core Course	Industrial Economics	A
PUSEC603	Discipline Specific Course	Urban Economics	A
PUSEC604	Ability Enhancement Course	Emotional Intelligence	C
PUSEC605	Skill Enhancement Course	Data Analysis	A
PUSEC605P	Skill Enhancement Course	Data Analysis Practical using Python (Practical)	D
PUSEC606	Ability Enhancement Course	Project Work	C
PUSEC605E	Elective	Accountancy and Financial Statement Analysis	A

# **SEMESTER VI**

BOS	B.Sc. Economics
Class	T.Y. B.Sc. Economics
Semester	V
Course Name	Development Economics
Course Code	PUSEC501
Course Type	Core Course
Level of the Course	Advanced
Credits	4

**Course objectives:**

1. To provide insights about the fundamental models used to analyze theoretical and empirical issues in economic growth and development.
2. To analyze the economic problems of developing countries, especially problems related to slow growth, high poverty rates, high income inequality etc.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Economic growth and development	1.1	Economic growth and development, Determinants of economic development	15
		1.2	Characteristics of underdeveloped countries	
		1.3	Factors in economic development	
		1.4	Stages of economic development	
2	Theories of economic development	2.1	Rostow's stages of economic growth	15
		2.2	Economic growth model by Solow	
		2.3	Big push model of growth	
		2.4	Nurkse theory of balanced growth, Schumpeter's theory of economic development	
3	Indices of human development	3.1	Kuznets curve, Lorenz curve	15

		3.2	Human Development Index, Gender Development Index	
		3.3	Gender Inequality Index, Gender Empowerment Measure	
		3.4	Inequality adjusted HDI, Multidimensional Poverty Index, Global Happiness Index	
4	Economic performance of developing countries	4.1	Comparing developing economies- economic performance over recent past	15
		4.2	With reference to India	
		4.3	With reference to China	
		4.4	With reference to Africa, Latin America	
<b>Total number of Lectures</b>				<b>60</b>

**Course Outcomes:** By the end of the course the student will be able to:

1. Describe economic growth and development.
2. Discuss theories of economic development.
3. Examine the indices of human development.
4. Explain Kuznets curve, Lorenz curve.
5. Analyze stages of economic development.
6. Create a model comparing the economic performance of developing countries.

**Reference Books:**

1. Bardhan, P. and C. Udry (1999), Development Microeconomics, Oxford University Press.
2. Basu, K. (2003), Analytical Development Economics: The Less Developed Economy Revisited, The MIT Press.
3. Meier, G. and J. Rauch (2004), Leading Issues in Economic Development, 7th edition, Oxford University Press.
4. Ray, D. (1998), Development Economics, Princeton University Press.
5. Thirlwall, A.P. (2006), Growth and Development, 8th edition, Palgrave Macmillan.

Case Studies	1	Since China began to open up and reform its economy in 1978, GDP growth has averaged over 9 percent a year, and more than 800 million people have lifted themselves out of poverty. There have also been significant improvements in access to health, education, and other services over the same period. China is now an upper-middle-income country.
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		<p>China's high growth based on investment, low-cost manufacturing and exports has largely reached its limits and has led to economic, social, and environmental imbalances. Over the past few years, growth has moderated in the face of structural constraints, including declining labor force growth, diminishing returns to investment, and slowing productivity growth. The challenge going forward is to find new drivers of growth while addressing the social and environmental legacies of China's previous development path.</p> <p>China's economy continues to confront a structural slowdown. Potential growth has been on a declining trend, reflecting adverse demographics, dull productivity growth, and rising constraints to a debt-fueled growth model. Structural reforms are needed to revive and shift to more balanced high-quality growth.</p>
	2	<p>India has moved up a rank on the global Human Development Index (HDI), according to the United Nations Development Programme (UNDP) report 'Breaking the gridlock: Reimagining cooperation in a polarised world' released on March 13. The report stated that while India ranked 135 in 2021, it had moved up to 134 in 2022. A total of 193 countries were ranked in 2022 and 191 countries in 2021. India's southern neighbour Sri Lanka has been ranked much ahead at 78, while China is ranked 75, both categorized under the High Human Development category. India also ranks below Bhutan that stands at 125 and Bangladesh, which is in the 129th position. India, Bhutan and Bangladesh are all in the Medium Human Development category. Switzerland has been ranked number one. Nepal (146) and Pakistan (164) have been ranked lower than India. India's life expectancy at birth has slightly improved from 67.2 years in 2021 to 67.7 years in 2022. There is an overall increase (5.88%) in expected years of schooling (EYS) from 11.9 years to 12.6 years, leading to an improvement of 18 places when the EYS aspect was considered. The Gross National Income (GNI) per capita also improved from \$6,542 to \$6,951.</p>

BOS	B.Sc. Economics
Class	T.Y. B.Sc. Economics
Semester	VI
Course Name	Agricultural Economics
Course Code	PUSEC502
Course Type	Core Course
Level of the Course	Advanced
Credits	4

**Course objectives:**

1. The objective of this course is to provide a detailed treatment of issues in agricultural economics to those intending to specialize in this area.
2. Its objective is to familiarize students with policy issues that are relevant to Indian agricultural economics and enable them to analyze the issues, using basic microeconomic concepts.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Introduction to Indian Agriculture	1.1	Role of Agriculture in Indian Economy	15
		1.2	Nature of India's Agriculture	
		1.3	Determinants of Agricultural output growth	
		1.4	Cropping Pattern in India and its factor determinants	
2	Agricultural Productivity & Indian Agricultural Policy	2.1	Trends in Agricultural Productivity in India	15
		2.2	Low Levels of Productivity: Causes & Measures	
		2.3	Policy measures in agricultural & rural development in India	
		2.4	WTO & Indian Agriculture: Agreements on Agriculture (AOA)	

3	Agricultural Subsidies & Public Distribution System in India	3.1	Concept of Agricultural Subsidies & subsidies on Agricultural inputs	15
		3.2	Benefits of Agricultural Subsidies in India	
		3.3	Public Distribution system in India: Meaning & types	
		3.4	Importance & Issues of Public Distribution System	
4	Recent Developments in Agriculture	4.1	Commercialisation of agriculture, Corporate farming and Contract Farming	15
		4.2	Mechanization of Indian Agriculture, Digitalisation of Indian Agriculture	
		4.3	AI in Agriculture, Agriculture Research in India	
		4.4	Agricultural Education, ICAR	
<b>Total number of Lectures</b>				<b>60</b>

**Course Outcomes:** By the end of the course the student will be able to:

1. Explain the role, nature and determinants of Agriculture in India.
2. Discuss the cropping pattern and trends in agricultural productivity.
3. Examine the role of Indian Agricultural policy measures and WTO.
4. Evaluate Agricultural subsidies and Public distribution system.
5. Analyze the commercialisation of agriculture in India.
6. Create an understanding of AI in Agriculture, Agriculture Research in India.

**Reference Books:**

1. Bhalla, G.S. and Singh Gurmail (2001), Indian Agriculture: Four Decades of Development, Sage Publications, N. Delhi.
2. Jharwal, S. M. (1998), 1st edition, Public Distribution System in India, Manak Publications, India.
3. Datta, S. K. and Chakravarti, M. (2001), Reforming Agriculture in the WTO Environment, in Dutta and Deodhar (eds.), Implications of WTO Agreements for Indian Agriculture, Oxford and IBH Publishing Company, New Delhi
4. Deodhar, Satish (2001), WTO Agreements on Indian Agriculture: Retrospection and Prospects, in Dutta and Deodhar (eds.), Implications of WTO Agreements for Indian Agriculture, Oxford and IBH Publishing Company, New Delhi
5. Gulati, A. and Bhide S. (1993), Structural Adjustment and Agriculture, Working Paper No. 44, NCAER, New Delhi.

<p><b>Case Studies</b></p>	<p>1</p>	<p>India is primarily an agrarian economy, with over 60% of its population engaged in agriculture. However, the sector has faced numerous challenges, including outdated farming techniques, low productivity, and labour-intensive practices. Mechanization has emerged as a potential solution to address these issues and enhance agricultural productivity. Mechanization in Indian agriculture offers significant potential to enhance productivity and address various challenges facing the sector. However, it also comes with challenges related to cost, awareness, and environmental sustainability. Government support and awareness-building efforts are crucial in facilitating the widespread adoption of mechanization and ensuring that its benefits reach all segments of the farming community. This case study examines the impact of mechanization on Indian agriculture and the associated opportunities and challenges.</p>
	<p>2</p>	<p>India is one of the world's largest rice producers, with millions of smallholder farmers relying on rice cultivation for their livelihoods. However, traditional farming practices, limited access to modern technology, and climate change have posed significant challenges to sustainable rice production. This case study examines the impact of technological adoption on rice farming in India, a country where agriculture is a major contributor to the economy but faces challenges such as low productivity and resource constraints. Farmers in a rural region of India started adopting modern agricultural technologies, including high-yielding rice varieties, precision farming techniques, and machinery like combine harvesters. The Indian government initiated programs to promote technology adoption among farmers, offering subsidies on machinery, providing training on modern farming techniques, and ensuring access to credit for purchasing equipment and inputs.</p>



BOS	B.Sc. Economics
Class	T.Y. B.Sc. Economics
Semester	V
Course Name	Financial Economics
Course Code	PUSEC503
Course Type	Discipline Specific Course
Level of the Course	Advanced
Credits	4

**Course Objectives:**

1. To familiarize students with the financial system and its components viz. financial instruments, financial institutions and financial market.
2. To familiarize about the workings of different financial markets including money market, capital markets and derivative markets.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Financial System	1.1	The Structure of the Financial System in India	15
		1.2	Diversity, Equity & Inclusion in Banking	
		1.3	Digitization and the Digital Economy- Financial Technology (Fintech): Relevance & Impact	
		1.4	Digitalisation of Banks-Digitization of Stock Exchanges	
2	Money Market, Capital Market & Derivatives Market	2.1	Structure of Indian Money Market - Money Market reforms in India	15
		2.2	Structure of Capital market- Capital market Reforms in India	
		2.3	Derivative Markets in India: Types, Participants, Functions	
		2.4	Recent Developments in Derivative Markets in India	

3	Regulation of Financial Markets	3.1	Regulatory Bodies in Indian Financial System: Securities and Exchange Board of India (SEBI), Reserve Bank of India (RBI), Insurance Regulatory and Development Authority of India (IRDAI)	15
		3.2	Pension Funds Regulatory and Development Authority (PFRDA), Association of Mutual Funds in India (AMFI), Ministry of Corporate Affairs (MCA)	
		3.3	Finance Bill 2022 & Financial Proposals 2022-23	
		3.4	Financial services (BFSI) trends in 2023	
4	Recent Trends in Financial Markets	4.1	Aadhar-enabled Payment System, NEFT-Digital Wallet- Unified Payment Interface (UPI) of India, RuPay	15
		4.2	Finance Apps, Top Fintechs in India	
		4.3	Virtual Digital Assets, CryptoCurrency	
		4.4	Investment in Stock Markets, Investment in Direct MF, Gold ETFs & NPS	
<b>Total number of Lectures</b>				<b>60</b>

**Course Outcome:** By the end of the course the student will be able to:

1. Describe the financial system in India and the process of digitalisation.
2. Explain the structure and reforms of the Indian money market.
3. Examine the structure and reforms of the Indian capital market.
4. Assess the structure and reforms in the Indian derivatives market.
5. Examine the regulatory bodies in the Indian Financial System.
6. Create an understanding of recent trends in financial markets

**Reference Books:**

1. Singh, Jaspal (2019), Digital Payments in India, New Century Publications, New Delhi.
2. Khanna, Ram, Singh Paramjeet (2019), (New Century Publications, New Delhi.
3. Bhole, L.M. (1999), Financial Institutions and Markets, Tata McGraw Hill Company Ltd., New Delhi.
4. Edminster, R.O. (1986), Financial Institutions, Markets and Management, McGraw Hill, New York.
5. Hanson, J.A. and S.Kathuria (Eds.) (1999), India: A Financial Sector for the Twenty-first Century, Oxford University Press, New Delhi.
6. Khan, M.Y. (1996) Indian Financial System, Tata Mc Graw Hill, New Delhi.

Case Studies	I	<p><b>Paytm: Pioneering India's Digital Payment Revolution</b></p> <p>Paytm, established in 2010, stands as a beacon of India's digital payment transformation. Initially conceived as a mobile recharge and bill payment platform, Paytm swiftly evolved into a multifaceted ecosystem.</p> <p>In its nascent years, Paytm introduced the revolutionary concept of the Paytm Wallet, a digital repository for money enabling seamless transactions. The watershed moment arrived in 2016, post-demonetization, when Paytm experienced unprecedented growth as consumers sought refuge in digital payment solutions. Recognizing the need for financial inclusion, Paytm ventured into uncharted territories, launching the Paytm Payments Bank in 2017, thus democratizing banking services for the masses.</p> <p>Amidst the challenges posed by regulatory frameworks and fierce competition, Paytm persevered, leveraging strategic partnerships, cashback incentives, and relentless innovation. The company's commitment to security and transparency earned the trust of millions of users, propelling it to the forefront of India's digital economy.</p> <p>The impact of Paytm reverberates across various facets of Indian society. By fostering financial inclusion, Paytm has empowered millions of unbanked individuals, catalyzing economic growth and job creation.</p>
	II	<p><b>Gold ETFs: Streamlined Investing in Precious Metals</b></p> <p>Gold ETFs (Exchange-Traded Funds) present a modernized approach to investing in gold, offering numerous advantages over traditional physical gold ownership. These funds provide investors with a convenient and cost-effective way to gain exposure to the price movements of gold without the need for physical storage. In contrast, owning physical gold entails storage expenses and security concerns.</p> <p>In India, as of 2024, several Gold ETF options are available to investors. Notable examples include HDFC Gold ETF, SBI Gold ETF, and ICICI Prudential Gold ETF. These funds track the performance of gold prices closely, allowing investors to capitalize on fluctuations in the gold market without directly purchasing or storing the metal.</p> <p>Furthermore, Gold ETFs offer liquidity, enabling investors to buy and sell shares throughout the trading day on stock exchanges. This liquidity provides flexibility and the ability to swiftly respond to market conditions. On the other hand, selling physical gold can be a time-consuming process, involving appraisal and finding a buyer.</p> <p>Overall, Gold ETFs offer investors a streamlined and efficient means of investing in gold, with benefits such as convenience, cost-effectiveness, liquidity, and transparency, making them an attractive option in the realm of precious metal investments.</p>

BOS	B.Sc. Economics
Class	T.Y. B.Sc. Economics
Semester	V
Course Name	Game Theory
Course Code	PUSEC504
Course Type	Discipline Specific Course
Level of the Course	Advanced
Credits	2

**Course objectives:**

1. The aim of the course is to provide an introduction to the study of game theory which has found wide applications in economics, political science, sociology, engineering apart from disciplines like mathematics and biology.
2. To familiarize students with different types of games, such as simultaneous-move games, sequential-move games, and repeated games, and solution concepts such as dominant strategies, mixed strategies, and subgame perfect equilibrium.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Introduction to Game Theory	1.1	Meaning & Introduction to game theory	11
		1.2	Uses of game theory, Types of game theory	
		1.3	Elements of Game theory: strategies, payoff, payoff matrix, zero sum games, non-zero sum games.	
2	Concepts of Game theory	2.1	Theory of rational choice	11
		2.2	Dominant and dominated strategies: Pay-off matrix	
		2.3	Cooperative and Competitive Games	
3	Extensive Games and Nash Equilibrium	3.1	Strategy Games Model : Introduction	12
		3.2	Prisoners Dilemma and Matching pennies	
		3.3	The Stag Hunt and Nash equilibrium	

4	Illustrations of Nash Equilibrium	4.1	Cournot's model of duopoly market	11
		4.2	Bertrand's model of duopoly market	
		4.3	Electoral competition theory	
<b>Total number of Lectures</b>				<b>45</b>

**Course Outcomes:** By the end of the course the student will be able to:

1. Explain the uses, types and elements of the game theory.
2. Discuss theory of rational choice and dominant and dominated strategies.
3. Examine Cooperative and Competitive Games and strategy game models
4. Evaluate the theories of Prisoners Dilemma, Matching Pennies, the Stag hunt.
5. Analyze the Nash Equilibrium theory with payoff matrix.
6. Create understanding of Cournot's model, Bertand's model and electoral competition theory.

**Reference Books:**

1. Osborne, M.J. An Introduction to Game Theory, Oxford University Press, 2004
2. Mas-Colell, A., M.D. Whinston and J.R. Green Microeconomic Theory, Oxford University Press, 1995
3. Gibbons, R. A Primer in Game Theory, Pearson Education, 1992
4. Game Theory: An Introduction" by Steven Tadelis
5. Strategy: An Introduction to Game Theory" by Joel Watson

Case Studies	1	Suppose there are two companies, Company A and Company B, deciding whether to lower or maintain their prices for a particular product. The payoff matrix below represents the profits (in millions of dollars) for each company based on their pricing decisions. Determine the dominant strategy for Company A and Company B.
	2	Suppose that Anna, Brie and Caleb, the three players went to a restaurant for dinner. Find out the individual contribution if they have dinner together, by creating permutation and using shapley value.  $v(\{1\}) = 100$ , $v(\{2\}) = 125$ , $v(\{3\}) = 50$ , $v(\{1,2\}) = 270$ , $v(\{1,3\}) = 375$ , $v(\{2,3\}) = 350$ and $v(\{1,2,3\}) = 500$ .

BOS	B.Sc. Economics
Class	T.Y. B.Sc. Economics
Semester	V
Course Name	Data Visualization & Decision Making
Course Code	PUSEC505
Course Type	Skill Enhancement Course
Level of the Course	Medium
Credits	2

**Course objectives:**

1. To provide students with an introduction to data visualization and hands-on experience in using Python and Tableau to create effective visualizations for data analysis. The syllabus covers the basic principles of visual perception, data manipulation using Python, and creating visualizations with Matplotlib, Seaborn, Plotly, and Tableau.
2. To teach students how to design and present effective data visualizations that communicate insights and findings from data. The syllabus covers best practices for designing visualizations, choosing appropriate chart types for different types of data, and communicating data insights through visualizations. The final project allows students to apply the concepts and techniques learned in the course to a real-world dataset and present their findings through visualizations.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Introduction to Data Visualization	1.1	Overview of data visualization and its importance in data analysis.	11
		1.2	Introduction to different types of data visualizations and when to use them	
		1.3	Basic principles of visual perception and their application in creating effective visualizations	
2	Data Manipulation in Python	2.1	Introduction to Python and Jupyter Notebook	11
		2.2	Importing and manipulating data using Pandas library	

		2.3	Data cleaning and formatting for visualization purposes	
3	Data Visualization with Matplotlib and seaborn	3.1	Introduction to Matplotlib library and its functionalities, Creating basic plots such as line plots, scatter plots, and histograms	11
		3.2	Customizing plots with different colors, labels, and annotations, Introduction to Seaborn library and its functionalities	
		3.3	Creating advanced plots such as heatmaps, pair plots, and bar plots	
4	Introduction to Tableau	4.1	Overview of Tableau and its functionalities, Connecting Tableau to different data sources	12
		4.2	Creating basic visualizations in Tableau	
		4.3	Creating advanced visualizations such as dual-axis charts, tree maps, and box plots, customizing Tableau visualizations with color schemes, filters, and calculations	
<b>Total number of Lectures</b>				<b>45</b>

**Course Outcomes:** By the end of the course the student will be able to:

1. Understand the fundamental principles of data visualization and its importance in data analysis.
2. Use Python and Jupyter Notebook to import and manipulate data for visualization purposes.
3. Create basic and advanced visualizations using Matplotlib, Seaborn, and Plotly libraries.
4. Connect Tableau to different data sources and create basic and advanced visualizations.
5. Choose appropriate chart types for different types of data and Communicate data insights effectively through visualizations.
6. Work with real-world data and apply data visualization techniques to solve problems and critically evaluate the effectiveness of visualizations in communicating data insights.

**Reference Books:**

1. "Python for Data Analysis" by Wes McKinney - This book provides an in-depth introduction to data analysis with Python and covers the use of the Pandas library for data manipulation and analysis.
2. "Data Visualization with Python and Matplotlib" by Valentina Porcu - This book provides a comprehensive introduction to data visualization using Matplotlib and covers the

creation of a wide range of visualizations, including line plots, scatter plots, bar charts, and heatmaps.

3. "Data Visualization with ggplot2" by Hadley Wickham - This book provides an introduction to data visualization using ggplot2, a popular visualization package in the R programming language. While this book uses R, the concepts and techniques can be applied to Python as well.
4. "Tableau for Dummies" by Molly Monsey and Paul Sochan - This book provides a beginner-friendly introduction to Tableau and covers the basics of creating visualizations and dashboards using the software.
5. "Storytelling with Data: A Data Visualization Guide for Business Professionals" by Cole Nussbaumer Knaflic - This book provides guidance on designing effective data visualizations and telling compelling stories with data.



BOS	B.Sc. Economics
Programme	T. Y. B.Sc. Economics
Semester	V
Course Name	Data Visualization & Decision Making Practical using Tableau/ Python
Course Code	PUSEC506P
Course Type	Skill Enhancement Course
Level of the Course	Medium
Credits	2

S.N.	Topic	CO
1	Import the "GDP.csv" dataset into Python and create a line plot that shows the trend in GDP over time.	CO1
2	Using the "Inflation.csv" dataset, create a scatter plot that shows the relationship between inflation and unemployment.	CO2
3	Create a bar chart in Python that shows the top 10 countries with the highest GDP in 2020.	CO2
4	Connect Tableau to the "Employment.csv" dataset and create a heatmap that shows the distribution of employment across different sectors.	CO2
5	Create a time-series visualization in Tableau that shows the trend in inflation over the last decade.	CO2
6	Using the "Trade.csv" dataset, create a choropleth map that shows the value of exports by country.	CO3
7	Create a stacked bar chart in Python that shows the composition of GDP by sector in a particular country.	CO3
8	Connect Tableau to the "Stocks.csv" dataset and create a line chart that shows the trend in stock prices over time.	CO4
9	Using the "Consumption.csv" dataset, create a scatter plot that shows the relationship between consumption and income.	CO5

10	Create a dashboard in Tableau that combines multiple visualizations related to a particular topic, such as the economic impact of COVID-19.	CO6
<b>Total number of Lectures</b>		<b>15</b>

BOS	B.Sc. Economics
Class	T.Y. B.Sc. Economics
Semester	V
Course Name	Financial Institutions and Markets
Course Code	PUSEC505E
Course Type	Elective
Level of the Course	Advanced
Credits	4

**Course objectives:**

1. The students of economics should be well conversant with the theory and practice of different financial institutions and markets
2. To understand and analyze the interconnection between the monetary forces and real forces, their developmental role and limitations in shaping and influencing the monetary and related policies both at the national and international levels.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Financial System and Market Risk Management	1.1	Structure of Financial System, Real assets and financial claims – A framework for macro-economic analysis of financial and non-financial flows	15
		1.2	The relation between stocks and flows. Types of Risk - importance of the risks in the competitive management of the banking institutions	
		1.3	Rate of interest – International transactions – Exchange rates	
2	The Central Bank, Commercial Banks and Co-operative Banks	2.1	Functions of Central Banks- The aims and objectives of the monetary policy in developed and developing countries	15
		2.2	Instrument of monetary policy - Effectiveness of monetary policy	

		2.3	Credit creation and its control; Commercial Banks- Profitability and efficiency of banks- role in the economy; Co-operative Banks- Role in the economy.	
3	Specialized Financial Institutions	3.1	Industrial Finance Corporation of India (IFCI), Industrial Development Bank of India (IDBI), Industrial Credit and Investment Corporation of India (ICICI), Industrial Investment Bank of India (IIBI)	15
		3.2	Small Industries Development Bank of India (SIDBI), SCICI Ltd., National Bank for Agriculture and Rural Development (NABARD), Export Import Bank of India, National Housing Bank	
		3.3	Insurance Companies- types of insurance companies, Securities Firms and Investment Banks, Finance Companies, Mutual Funds, Pensions Funds	
4	International Financial Institutions	4.1	International Financial Institutions - IMF, World Bank, IFC, ADB, IDA, BIS (Bank of International Settlements) and their role	15
		4.2	US Money and Capital Markets, London Money and Capital Markets	
		4.3	Foreign Trade Finance, External Commercial Borrowings, GDR's and ADR's – Euro Currency and Eurobond Market	
<b>Total number of Lectures</b>				<b>60</b>

**Course Outcomes:** By the end of the course the student will be able to:

1. Explain the Structure of the Financial System.
2. Discuss effectiveness of monetary policy.
3. Examine profitability and efficiency of banks.
4. Evaluate the specialized Financial Institutions.
5. Analyze the International Financial Institutions.
6. Create understanding of External Commercial Borrowings, GDR's and ADR's, Eurocurrency and Eurobond Market..

**Reference Books:**

1. Bhole, L.M. (2003), Financial Institutions and Markets, 3rd edition, Tata Mc Graw Hill Company Ltd., New Delhi

2. Bhole, L.M. (2000), Indian Financial System, Chugh publications, Allahabad.
3. Edminster, R.O. (1986), Financial Institutions, Markets and Management, McGraw Hill, New York.
4. Goldsmith, R.W. (1969), Financial Structure and Development, Yale, London.
5. Hanson, J. A. and S. Kathuria (Eds.) (1999): A Financial sector for the Twenty-First Century, Oxford University Press, New Delhi.
6. Harker, P.T. and Zenious, S.A. (2000) (Ed.) Performance of Financial Institutions, Cambridge University Press, Cambridge.
7. Johnson, H.J. (1993), Financial Institutions and Markets, McGraw Hill, New York.

# **SEMESTER VI**

BOS	B.Sc. Economics
Class	T.Y. B.Sc. Economics
Semester	VI
Course Name	International Economics
Course Code	PUSEC601
Course Type	Core Course
Level of the Course	Advanced
Credits	4

**Course objectives:**

1. To provide the students with a thorough grounding in the theory of international trade as well as international trade policy.
2. To demonstrate the relevance of the economic implications of international trade and trade policy both for individual economies such as India and the wider international community.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Introduction to International Trade	1.1	Theories of International Trade - Ricardo's theory of comparative costs	15
		1.2	Heckscher Ohlin Theory of international trade	
		1.3	Terms of Trade - Types and limitations, factors affecting TOT	
		1.4	Gains from trade	
2	Commercial Policy	2.1	Free trade and protectionist policy	15
		2.2	Tariff and non-tariff barriers: Meaning, types and effects	
		2.3	International economic integration – Types and objectives	
		2.4	European Union and Brexit, ASEAN	

3	Balance of Payments & International Economic Organization	3.1	Balance of Payments: Meaning, structure, types and causes	15
		3.2	Measures to correct the disequilibrium in Balance of Payments	
		3.3	International capital movements: Meaning & factors affecting international capital movements	
		3.4	WTO- Recent Developments in TRIPS, TRIMS and GATS	
4	Foreign Exchange Market	4.1	Foreign Exchange Market: Meaning, functions, participants and dealers	15
		4.2	Determination of equilibrium exchange rate, Spot and forward exchange rates	
		4.3	Fixed, flexible, managed flexible exchange rate systems	
		4.4	Stages of foreign exchange management in India	
<b>Total number of Lectures</b>				<b>60</b>

#### **Expected Outcome:**

1. Define the concepts of terms of trade, balance of payments.
2. Explain disequilibrium in balance of payments, foreign exchange market.
3. Diagrammatically illustrate the offer curve, gains from trade, tariff & non- tariff barriers.
4. Examine spot & forward rate, fixed & flexible exchange rate, stages of foreign exchange management in India.
5. Evaluate Ricardo's theory, Heckscher Ohlin theory and agreements under WTO.
6. Create an alternate strategy for EU & Brexit, ASEAN.

#### **Reference Books:**

1. M.L. Zinghan, International Economics, Vrinda Publication, 1986
2. Paul Krugman, International Economics: Theory and Policy, 1988
3. Jagdish N. Bhagwati, Free Trade Today, 2001
4. Joseph E. Stiglitz, Globalization and its Discontents, 2002
5. Philip B Whyman, The Economics of Brexit: A Cost-Benefit Analysis of the UK's Economic Relationship with the EU
6. Dominick Salvatore, International Economics: Trade and Finance, 2013
7. Joseph E. Stiglitz, The Euro: How a Common Currency Threatens the Future of Europe, 2016.



Case Studies	1	<p>India's current account deficit for the second quarter of 2022-23 has reached a massive \$36.4 billion, which is 4.4% of the gross domestic product, higher than at any time in the last nine years.</p> <p>Quite apart from the sheer size of the current account deficit, there are three reasons why the balance of payments is a cause for serious concern.</p> <p>First, is an increase in merchandise trade deficit, which increased by over \$20 billion, from \$63 billion to \$ 83.5 billion, between the first and the second quarters. The increase in oil prices that has occurred in the wake of the Ukraine war and pushed up our import bill. Second, the lackluster performance of our exports because of the slowing down of the world economy.</p> <p>The second cause is sharp decline in the exchange rate of the rupee and despite our large reserves India's balance of payments have become a serious cause for concern.</p> <p>The third reason was the slowdown in growth was a slowing down of the manufacturing sector.</p>
	2	<p>In India, the exchange rate regimen is governed by the Reserve Bank of India (RBI), often called the 'Banker of Banks'. There are several types of exchange rate regimes, including managed float, free float, and a flexible exchange rate. India follows a managed floating rate system. It gives a lot of independence to the market forces, provides data to regulators, and stabilizes India's economy. Starting in 1991, when India's economic policy underwent a renovation, and the markets opened to global companies, this regime has helped the country get back on its feet. At first glance, a managed float system may not seem useful. However, economists and policy-makers have observed that since India needs to import certain essential items like crude oil, it is important for a Central Bank to maintain a tight leash on exchange rates.</p>

BOS	B.Sc. Economics
Class	T.Y. B.Sc. Economics
Semester	VI
Course Name	Industrial Economics
Course Code	PUSEC602
Course Type	Core Course
Level of the Course	Advanced
Credits	4

**Course objectives:**

1. To familiarize students with the fundamentals of Industrial Economics.
2. To familiarize students with the recent industrial sector developments.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Introduction	1.1	Meaning and Scope of Industrial Economics: Classification of Industries, Industrial Clusters	15
		1.2	Indian Industry in historical Perspective: Pre-Independence and Post Independence Period	
		1.3	Important Laws to Regulate Industry and Business	
		1.4	Industrial Finance: Sources	
2	Industrial Profile	2.1	Public Sector Enterprises: Role and Developments	15
		2.2	Private Sector Enterprises: Role and Developments	
		2.3	Micro, Small and Medium Enterprises: Role and Developments	
		2.4	Export Oriented Units: Role and Support, Domestic Industry and FDI	

3	Industrial Imbalances & Industrial Productivity	3.1	Location of Industry, Determinants, Causes and Need for balanced regional development	15
		3.2	Concept and Measurement of Industrial Productivity Factors Affecting Industrial Productivity	
		3.3	Industrial Sickness - Causes, Effects and Remedial Measures	
		3.4	Mergers and Acquisitions	
4	Recent Industrial Sector Developments	4.1	Industry and Internet	15
		4.2	Ease of Doing Business in India	
		4.3	New Rules Governing Corporate Social Responsibility in India	
		4.4	Recent Measures to Improve Business Environment in India	
<b>Total number of Lectures</b>				<b>60</b>

**Course Outcome:** By the end of the course the student will be able to:

1. Describe the scope of industrial economics, laws that regulate industry and sources of Industrial Finance.
2. Explain the role and developments of Public Sector Enterprises, Private Sector Enterprises and Micro, Small and Medium Enterprises.
3. Examine Export Oriented Units: Role and Support, Domestic Industry and FDI.
4. Assess the need for balanced regional development and factors affecting industrial productivity.
5. Examine the industrial sickness, mergers and acquisitions.
6. Create an understanding of recent industrial sector developments.

**Reference Books:**

1. Mani, N. ( 2021), Industrial Economics Singh, Jaspal (2019), (New Century Publications, New Delhi.
2. Datt R. and Sundaram K.P.M. (2009), Indian Economy, S.Chand & Co., New Delhi
3. Agrawal A.N. (2011), Indian Economy, New Age International Publishers, New Delhi
4. Barthwal R.R. (2007) , Industrial Economics , New Age International Publishers, New Delhi
5. Cherunilam, F. (1994), Industrial Economics : Indian Perspective, Himalaya Publishing House, Mumbai

6. Desai S.S.M. and Bhalerao N (2008), Industrial Economy of India, Himalaya Publishing House, Mumbai
7. Kuchhal S.C. (1980), Industrial Economy of India, Chaitanya Publishing House, Allahabad
8. Mishra S.K. and Puri V.K.(2008), Indian Economy, Himalaya Publishing House, Mumbai

Case Studies	I	<p><b>The Internet's Impact on India's Industry</b></p> <p>India's industrial landscape has undergone a significant transformation due to its integration with the digital world. The advent of e-commerce platforms like Flipkart, Amazon, and Snapdeal has revolutionized retail in India. These platforms have democratized access to goods and services, particularly in rural areas, leading to unprecedented growth in consumer spending.</p> <p>The internet has facilitated the digitalization of services across sectors such as banking, healthcare, and education. Initiatives like Digital India have accelerated this process, promoting online transactions and enhancing service delivery.</p> <p>India's manufacturing sector has embraced digital technologies such as IoT devices, automation, and data analytics to improve efficiency and competitiveness. These technologies optimize processes, reduce costs, and enable agile production methods.</p> <p>While the internet presents numerous benefits, challenges such as the digital divide, cybersecurity threats, and regulatory hurdles persist. However, these challenges also provide opportunities for innovation and collaboration. As India continues its digital transformation journey, effectively leveraging technology will be crucial for sustainable development and global competitiveness.</p>
	II	<p><b>Enhancing Ease of Doing Business in India</b></p> <p>India has been steadfastly improving its business environment to attract investment and promote economic growth. In recent years, significant efforts have been made to enhance the ease of doing business in the country. Reforms such as the introduction of the Goods and Services Tax (GST), simplification of tax procedures, and digitalization of government services have streamlined processes for businesses. Additionally, initiatives like Make in India and Startup India have been launched to encourage entrepreneurship and facilitate business setup.</p> <p>The implementation of online portals for registrations, licenses, and permits has reduced bureaucratic hurdles and minimized corruption. Furthermore, the</p>

	<p>Insolvency and Bankruptcy Code (IBC) has strengthened the legal framework for resolving insolvency issues, thereby boosting investor confidence.</p> <p>Despite these advancements, challenges persist, including complex regulatory frameworks at the state level and infrastructure deficiencies. Additionally, the country still grapples with issues related to contract enforcement and property rights. Moving forward, continued efforts are needed to make India a sought after destination for business.</p>
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BOS	B.Sc. Economics
Class	T.Y. B.Sc. Economics
Semester	VI
Course Name	Urban Economics
Course Code	PUSEC603
Course Type	Discipline Specific Course
Level of the Course	Advanced
Credits	4

**Course objectives:**

1. The objective of this course is to explore the nature of cities and emphasize the economic forces that shape the urban processes.
2. It examines the causes of urban problems such as poverty, disadvantage and urban sustainability.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Introduction	1.1	Definition and Scope of Urban Economics	15
		1.2	Emergence and Growth of Cities, Causes of Urban Growth	
		1.3	Demographic Sources: Natural Increase, Net Migration, International Migration	
		1.4	Geographical Sources: Urban reclassification and physical expansion of urban boundaries	
2	Economics of Urbanization	2.1	The Process of urbanization: Nature and dimensions, factors initiating and perpetuating urbanization process	15
		2.2	Characteristics of an economy passing through different stages of urbanization	
		2.3	Classification of urban areas: demographic, geographical and economic criteria	

		2.4	Process of suburbanization	
3	Theories of Urban Growth	3.1	Christaller's Central Place Theory	15
		3.2	Linear and Circular cities, Urban Size: Ratchet-Rank Size Rule	
		3.3	Theory of Optimum City Size	
		3.4	Urban externalities and growth.	
4	Urban Planning and Policies	4.1	Overpopulation and congestion, Urban housing problem and increase in slums	15
		4.2	Urban transport and peak load pricing; Urban poverty and inequality	
		4.3	Need for Urban Planning: Objectives and Techniques	
		4.4	Emerging Planning Process - Strategies and Issues, Jawaharlal Nehru National Urban Renewal Mission ,Smart Cities	
<b>Total number of Lectures</b>				<b>60</b>

**Course Outcomes:** By the end of the course the student will be able to:

1. Explain scope, emergence and different sources of urbanization.
2. Discuss the process, characteristics and classification of urbanization.
3. Examine the various theories of urbanization and urban externalities.
4. Evaluate the urban problems and urban poverty and inequality.
5. Analyze the need for urban planning.
6. Create an understanding of emerging planning processes and missions taken up in India.

**Reference Books:**

1. Dimitriou, T.H., (ed) (2013), Transport Planning for Third World Cities, Routledge Revivals, March
2. Button, K.J., Transport Economics, Edward Elgar Publishing Company, March, 2013
3. Levy, Contemporary Urban Planning, Prentice Hall: New York, March, 2012
4. Reports of WBPCB, CPCB
5. Cities Alliance, (2007), Washington, (<http://www.citiesalliance.org/index.html>)
6. Rodney R White, (1998), Urban Environmental Management, John Wiley: New York
7. C. J. Barrow, (1996), Environment and Social Impact Assessment -An introduction, Arnold: New York

8. Documents related to Urban Planning and Policy of Government of India and different Urban Development Authorities.

Case Studies	1	<p>The global phenomenon of rapid urbanization has led to a surge in urban housing challenges, resulting in the proliferation of slums in many cities around the world. This case study focuses on a specific urban area to analyze the root causes, consequences, and potential solutions related to the urban housing problem and the increase in slums. Mumbai, one of the most populous cities in India, has experienced significant population growth due to rural-to-urban migration and natural population increase. This influx has put immense pressure on the city's housing infrastructure, leading to widespread housing issues and the emergence of slums.</p>
	2	<p>The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was launched by the Government of India in 2005 with the aim of transforming urban areas and improving the quality of life for residents. India, experiencing rapid urbanization, faced numerous challenges related to inadequate infrastructure, slum proliferation, and deficient basic services. In response, the JNNURM was initiated to address these issues and promote sustainable urban development. JNNURM, as a flagship program, has significantly influenced urban development in India.</p>



BOS	Department of Skill Development and Entrepreneurship
Class	T.Y. B.Sc. Economics
Semester	VI
Course Name	Emotional Intelligence
Course Code	PUSEC604
Course Type	Ability Enhancement Compulsory Course
Level of the Course	Basic
Credits	2

**Course objectives:**

1. To learn how to lead with emotional intelligence.
2. To study different aspects of self-management, building on the foundation of (i) self-awareness (ii) self-regulation (iii) Social skills and empathy and (iv) Relationship Management.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Introduction to Emotional Intelligence and Self Awareness	1.1	Introduction to emotional intelligence, dimensions of emotional intelligence, difference between EQ v/s IQ.	15
		1.2	Emotional competencies, importance of EI, the concept of emotional hijacking	
		1.3	Meaning of self-awareness, benefits of self-awareness, self-awareness strategies, self-awareness skills.	
2	Self- regulation and elements	2.1	Introduction to self-regulation, self- regulation strategies.	10
		2.2	Self- control, meaning of self-control, three habits of self-control, assessing your self-control, developing self-control.	
		2.3	Concepts of trustworthiness, conscientiousness & adaptability.	

		2.4	Innovation and Innovation Skills	
3	Social Skills and empathy	3.1	Social skills in EI- meaning, elements: persuasion and influencing skills, communication skills, conflict management skills, leadership skills, change management skills, building bonds (rapport), collaboration and cooperation team-working skill.	10
		3.2	Empathy: Meaning, types, elements, tactics.	
4	Relationship Management	4.1	Relationship management in EI: Understanding relationship management, strategies, relationship management skills.	10
		4.2.	The competencies associated with relationship management, influence, leadership, developing communication, change catalyst. Four criteria for effective relationship management: Decision, interaction, outcome, needs.	
<b>Total number of Lectures</b>				<b>45</b>

**Course Outcomes:** By the end of this course, students will be able to,

1. Describe the value of emotional intelligence for professional success.
2. Relate the impact of self-awareness & self-control on others.
3. Develop strategies for strengthening empathy.
4. Examine capabilities to demonstrate social awareness through empathy.
5. Justify actions to create connections and build relationships for greater professional effectiveness.
6. Construct methodology for managing emotions.

**References Books:**

1. Emotional Intelligence, Daniel Goleman, Bloomsbury Publishing.
2. Emotional Intelligence: Why It Can Matter More Than IQ, Daniel Goleman, Bantam.
3. Emotional Intelligence 2.0, by Travis Bradberry, Jean Greaves, Perseus Books Group.
4. Emotional Intelligence at Work: A Professional Guide, Dalip Singh, Sage Publication.
5. Building Emotional Intelligence: Practices to Cultivate Inner Resilience in Children,
6. Linda Lantieri&Daniel Goleman
7. HBR's 10 Must Reads on Emotional Intelligence, Daniel Goleman, Richard Boyatzis, Annie Mckee& Sydney Finkelstein
8. Emotional Intelligence: How to Manage and Influence People, Improving
9. Communication with the Power of Emotional Intelligence, Earl Wells

**Weblinks:**

<https://www.skillsyouneed.com/ps/self-control.html>

<https://www.passingthebatonpodcast.com/relationship-management/>

<http://www.free-management-ebooks.com/faqpp/developing-05.htm>

<https://www.skillsyouneed.com/general/emotional-intelligence.html>

**Evaluation Pattern of Emotional Intelligence Course:**

<b>Sr. No</b>	<b>Particulars</b>	<b>Marks</b>
1	7 Quizzes x 5 marks each (5 questions-1 mark each)	35
2	Presentation, Podcasting, Short videos, Posters, Articles for Newsletters (Any two activities of 15 marks each)	30
3	Situational Awareness test (two tests of 15 marks each – each question carry 1 mark)	30
4	Active Participation	05
<b>Total</b>		<b>100</b>

BOS	B.Sc. Economics
Class	T.Y. B.Sc. Economics
Semester	VI
Course Name	Data Analysis
Course Code	PUSEC605
Course Type	Skill Enhancement Course
Level of the Course	Advanced
Credits	2

**Course objectives:**

1. Understanding basic Data Science concepts.
2. Learning to detect and diagnose common data issues, such as missing values, special values, outliers, inconsistencies and localization.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Introduction to Data And its Types.	1.1	What is Data? Different kinds of data, Data Sources, Different types of data sources	11
		1.2	Data Collection , Data Extraction, Data Modeling	
		1.3	Data Analysis and its Types , Data Analysis Life Cycle ,Difference Between Data analysis and Analytics	
2	The world of NUMPY	2.1	Diving with Numpy : Data Types of NumPy, creating an array from list and tuple, array attribute	11
		2.2	Creating array from existing data, Indexing and Slicing of 1D and 2D array, Searching of array, Iteration	
		2.3	Mathematical Function and operations, Joining , sorting and Filtering	
3	Data Analysis with PANDAS	3.1	PANDAS are fun! : Introduction to PANDAS ,	11

			Data Structures of PANDAS, DataFrame with its basic Functionality	
		3.2	Working with Dataframe : Reindexing, Sorting, Iteration, Aggregations.	
		3.3	Data Cleansing : Finding and treating missing data, Merging and Joining, Concatenation	
4	Advanced data Analysis	4.1	EDA :- Introduction and need of EDA , Types of EDA : Univariate, Bivariate, and Multivariate analysis , Statistical analysis with basic functions , Correlation computation , Filtering the data , Grouping , Summarizing	12
		4.2	Case study : Data Analysis on Marketing Dataset, Retail shop Dataset	
		4.3	Case study: Data Analysis on World Economy and Global Economic Monitor data.	
<b>Total number of Lectures</b>				<b>45</b>

**Course Outcomes:** By the end of the course the student will be able to:

1. Understand the Data analysis and Data Analytics
2. Enumerate the Various types of Data and Data Analysis Techniques.
3. Illustrate the Various Data transformation techniques with NumPy.
4. Apply the various functions on data for data cleaning and exporting.
5. Analyze the univariate and bivariate data.
6. Justify the generated output from various data analysis techniques.

**Reference Books:**

1. Hands on Data Analysis on Numpy and PANDAS by Curtis Miller, Packt Publications.
2. Mastering Python for Data Science, Explore the world of data science through Python and learn how to make sense of data, Samir Madhavan Packt Publishing.
3. Python Data Science Handbook: Essential Tools for Working with Data, Jake VanderPlas O'Reily

BOS	B.Sc. Economics
Class	T.Y. B.Sc. Economics
Semester	VI
Course Name	Data Analysis Practical using Python
Course Code	PUSEC606P
Course Type	Skill Enhancement Course
Level of the Course	Advanced
Credits	2

S.N.	Topic	CO
1	Read the Data from Excel, CSV, txt file and convert it to Dataframe.	CO1
2	Create 2 2D Numpy Array and perform the arithmetic operations and apply mathematical functions.	CO2
3	Write a NumPy program to swap rows and columns of a given array in reverse order.	CO3
4	Write a NumPy program to count the number of dimensions, number of elements and number of bytes for each element in a given array.	CO3
5	Create the DataFrame from Series and Dictionary and apply the basic functions. (head(), tail(), columns, describe(), info(), shape())	CO4
6	Write a Pandas program to split the following dataframe by Unique_column and get mean, min, and max value of age for respective dataset.	CO4
7	Write a Pandas program to split a given data frame into groups with multiple aggregations.	CO4
8	Read the CSV file and check and handle Missing and outliers for the numerical columns.	CO5
9	Create the PANDAS dataframe from the dictionary and perform Iterations, sorting and filtering operations.	CO4

10	Read the Global Trade dataset from the Kaggle community and Analyze the data.	CO6
<b>Total number of Lectures</b>		<b>15</b>

BOS	B.Sc. Economics
Class	T.Y. B.Sc. Economics
Semester	VI
Course Name	Project Work
Course Code	PUSEC607
Course Type	Ability Enhancement Course
Level of the Course	Medium
Credits	2

**Course objectives:**

1. To provide hands-on practice of research understanding in the field of Economics.
2. To widen the overall knowledge of research scope in the field of Economics and gain skills in research.

**Introduction to project work:**

Inclusion of project work in the course curriculum of B.Sc. Economics programme is one of the ambitious aspects in the programme structure. The main objective of inclusion of project work is to inculcate the element of research analysis and scientific temperament challenging the potential of the learner as regards to his/ her eagerness to enquire and ability to interpret a particular aspect of the study. It is expected that the guiding teacher should undertake the counselling sessions and make the awareness among the learners about the methodology of formulation, preparation and evaluation pattern of the project work. There are two modes of preparation of project work

1. Project work based on research methodology in the study area.
2. Project work based on an internship in the study area.

Sr. No.	Mode	Guidelines
1	Research Project	<ul style="list-style-type: none"> <li>• The project topic may be undertaken in any area of Elective Courses.</li> <li>• Each of the learners has to undertake a Project individually under the supervision of a teacher-guide.</li> <li>• The learner shall decide the topic and title which should be specific, clear and with definite scope in consultation with the teacher-guide concerned.</li> <li>• University/college shall allot a guiding teacher for guidance to the students based on her / his specialization.</li> </ul>



		<ul style="list-style-type: none"> <li>The project report shall be prepared as per the broad guidelines given below:  Font type: Times New Roman  Font size: 12-For content, 14-for Title Line Space: 1.5-for content and 1-for in table work Paper Size: A4  Margin: in Left-1.5, Up-Down Right-1, The Project Report shall be bounded.  The project report should be 70 to 80 pages</li> </ul>
2	Internship Project	Minimum 16 days/ 80 hours of Internship with an Organization/ NGO/ Charitable Organization/ Private firm. The theme of the internship should be based on any study area of the discipline specific / core courses · Experience Certificate is Mandatory.

**Course Outcomes: By the end of the course the student will be able to:**

1. Outline the areas related to study for research and define its objectives.
2. Examine the scope of the selected area and its relevance to the current scenario.
3. Identify the skills and knowledge needed to apply for conducting the study.
4. Determine the methodology to be adopted for undertaking the study.
5. Explore the potential of the research study undertaken in a future context.
6. Design /Propose a comprehensive plan of research based on formulation, preparation, and evaluation of the related area study.

**Reference Books:**

1. Research Methodology, C. R. Kothari. New Age International, 2009.
2. Research Methodology – Tools and Techniques, Dr. Prabhat Pandey & Dr. Meenu Pandey, Bridge Centre, 2015.

BOS	B.Sc. Economics
Class	T.Y. B.Sc. Economics
Semester	VI
Course Name	Accountancy and Financial Statement Analysis
Course Code	PUSEC605E
Course Type	Elective
Level of the Course	Advanced
Credits	4

**Course objectives:**

1. The course aims at providing basic understanding of various essential concepts of accountancy.
2. It helps in preparation of accounting statements, introduction to accounting standards etc.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Basic Principles	1.1	Financial Accounting & Accounting Standards- Accounting Equations	15
		1.2	Users of Accounting Statements, Importance Objectives and Principles Accounting Concepts and Conventions	
		1.3	Principle of Double Entry Bookkeeping, Trends in Accounting principles, GAAP, IFRS, IAS	
2	The Accounting Process	2.1	Preparation of Books of Original Records: Journals Subsidiary Book	15
		2.2	Problems on Cash Book and Petty Cash Book Ledgers & Trial Balance	
		2.3	Classification of Capital and Revenue Expenses Final Accounts with Adjustments	

3	Preparation of Final Accounts/ Statement & Cash Flow Statement	3.1	Sole traders with Basic Adjustments	15
		3.2	Preparation of Final Accounts / Statement of Companies (Both Horizontal & Vertical Form of Financial Statements)	
		3.3	Cash Flow Statement	
4	Financial Analysis of Financial Performance of a Firm	4.1	Different Tools Ratio Analysis Different Types of Ratio's Inter-Relation Between Ratio's Due-point Analysis	15
		4.2	Common Size Statement of Inter Firm and Intra Firm Internal Revenue Code-Interpretation of Financial Statements From Investor and Company Point of View	
		4.3	Horizontal Analysis and Vertical Analysis of Company Financial Statements Liquidity, Leverage, Solvency and Profitability Ratios Du Pont Chart A Case Study on Ratio Analysis	
<b>Total number of Lectures</b>				<b>60</b>

**Course Outcomes:** By the end of the course the student will be able to:

1. Explain the Financial Accounting & Accounting Standards.
2. Discuss Principle of Double Entry Book keeping, Trends in Accounting principles.
3. Examine Classification of Capital and Revenue Expenses Final Accounts with Adjustments.
4. Evaluate the Cash Flow Statement.
5. Analysis of the Ratio Analysis.
6. Create understanding of Liquidity, Leverage, Solvency and Profitability Ratios Du Pont Chart.

**Reference Books:**

1. Ghosh, T.P., (2010), Understanding IFRS, Taxmann.
2. D'Souza, Dolphy, (2009), Indian Accounting Standards and GAAP In 2 Vol., Snow White Publications Pvt. Ltd.
3. International Accounting Standards Board (2007), International Financial Reporting Standards 2007 (including International Accounting Standards (IAS(tm)) and Interpretations as at 1 January 2007), LexisNexis, ISBN 1-4224-1813-8.

4. Case studies of IFRS implementation in Brazil, Germany, India, Jamaica, Kenya, Pakistan, South Africa and Turkey, United Nations Intergovernmental Working Group on International Standards of Accounting and Reporting (ISAR). (Various years)
5. Catty, James P. (2010), Wiley Guide to Fair Value, Under IFRS [6], ISBN: 0470477083, John Wiley & Sons.